

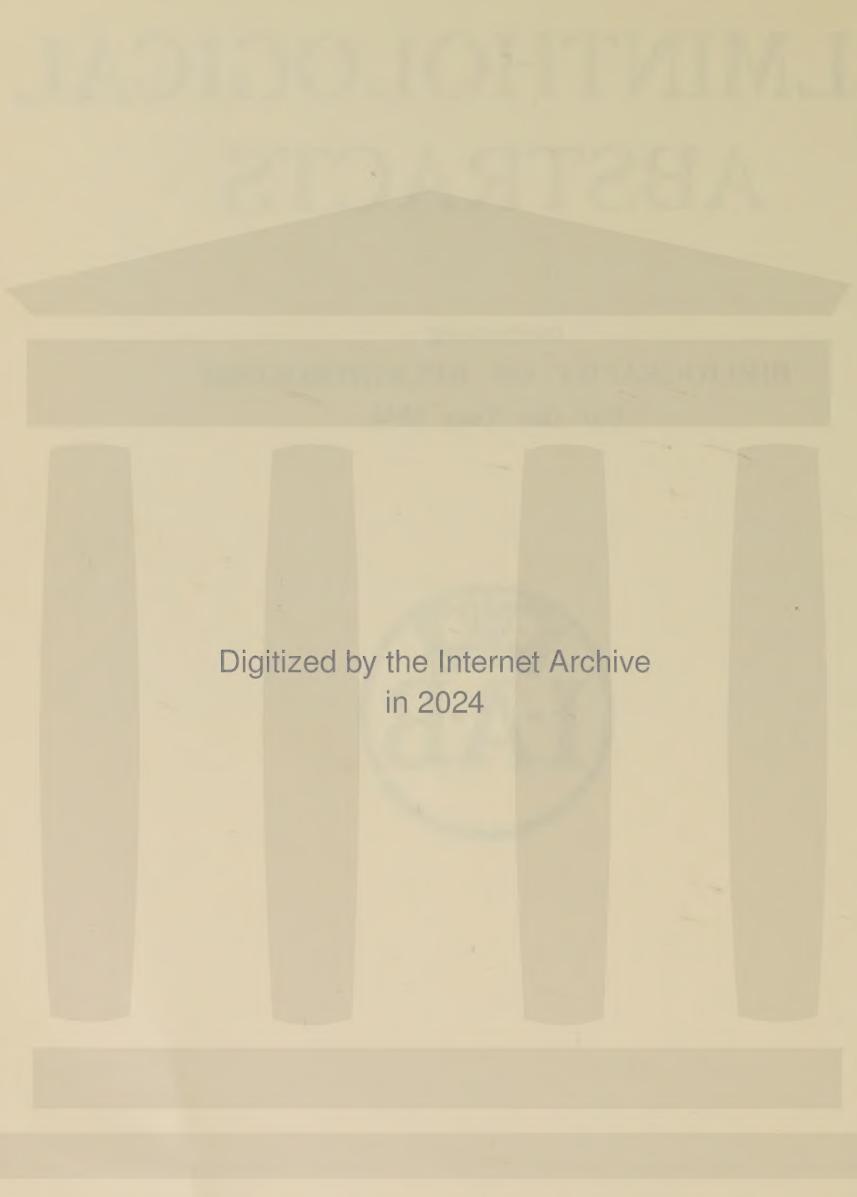
# HELMINTHOLOGICAL ABSTRACTS

*incorporating*  
**BIBLIOGRAPHY OF HELMINTHOLOGY**  
For the Year 1944.



**IMPERIAL BUREAU OF AGRICULTURAL PARASITOLOGY  
(HELMINTHOLOGY)**

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# HELMINTHOLOGICAL ABSTRACTS

INCORPORATING BIBLIOGRAPHY OF HELMINTHOLOGY  
FOR THE YEAR 1944.

Vol. XIII, Part 3.

## 76—África Médica.

a. SOARES, T. L., 1944.—“Acérca das parasitoses intestinais humanas mais freqüentes nos trópicos.” 10 (4), 49–64.

(76a) Faecal examination of 250 native servants in Portuguese West Africa showed 66 to be infected with *Necator americanus*, 14 with cestodes (*Taenia saginata*, *T. solium* or *Hymenolepis nana*), 8 with *Ascaris lumbricoides*, 4 with *Enterobius vermicularis*, 3 with *Trichuris trichiura*, one with *Strongyloides stercoralis*, and one with *Schistosoma mansoni*. A brief description of the disease caused by each of these helminths is given. Sanitary and other measures necessary to control these infections are discussed, and the risk to the white population is stressed. A.E.F.

## 77—Agricultural Journal. Department of Agriculture, Fiji.

a. LEVER, R. J. A. W., 1944.—“Entomological notes. 2. The filarial mosquito, *Aedes scutellaris pseudoscutellaris*.” 15 (2), 46.

## 78—American Heart Journal.

a. POLLEY, T. Z. & MURPHY, F. D., 1944.—“Cardiac involvement in trichinosis: report of a case in which there were electrocardiographic changes.” 27 (2), 266–272.

## 79—American Journal of Clinical Pathology.

a. CARRICK, L., 1944.—“The parathyroid glands in trichinosis.” 14 (1), 24–27.  
b. HARTZ, P. H., 1944.—“Contribution to the histopathology of filariasis.” 14 (1), 34–43.

(79a) In a series of guinea-pigs experimentally infected with *Trichinella spiralis* the parathyroid glands were moderately enlarged. Unencysted calcified larvae occurred in the myocardium. Encystment in the skeletal muscles occurred between the 33rd and 44th day after infection. The variations in the serum calcium, inorganic phosphorus and phosphatase activity were not significant. R.T.L.

(79b) Epitheloid cell granulomatous endolymphangitis, especially if combined with epitheloid cell perilymphangitis and eventually with changes in the lymph nodes, is considered by Hartz to be fairly typical, although not specific, of filariasis. The form of the epitheloid cells does not differ from that of these cells as found in tuberculosis. When adult filariae were living eosinophiles were absent or in very small numbers, but when the worms had died very great numbers could sometimes be found. In one case when a biopsy from the red and swollen epididymis was taken, necrotic filaria and enormous masses of eosinophiles were encountered. If the inflammation had been due to streptococci or staphylococci another composition of the cellular infiltrate should have been expected. Dead adults are often surrounded by a zone of necrosis walled off by epitheloid and giant cells suggestive of tuberculosis. R.T.L.

## 80—American Journal of the Medical Sciences.

a. HORNE, S. F. & HARRELL, G. T., 1944.—“Trichinella skin tests in patients in general hospitals and tuberculosis sanatoria.” 207 (6), 759–765.

(80a) Intradermal reactions with commercial antigen among hospital patients in North Carolina suggest that the incidence of trichinosis is rather lower there than in other states, only

10% giving positive reactions. A statistically higher percentage was obtained from tuberculous patients than from others, but there was no significant difference in the positives between rural and urban groups, between males and females, or between whites and coloured. Routine autopsy examinations have given only 2-5% affected. The incidence tended to increase with increasing age, reaching a maximum between the ages 50 to 60.

P.A.C.

### 81—American Journal of Tropical Medicine.

- a. HUDSON, E. H., 1944.—“The role of the reservoir host in tropical disease.” 24 (2), 125-130.
- b. WRIGHT, W. H. & MURDOCK, J. R., 1944.—“Intradermal reactions following the use of *Dirofilaria immitis* antigen in persons infected with *Onchocerca volvulus*.” 24 (3), 199-202.
- c. BOZICEVICH, J. & HUTTER, A. M., 1944.—“Intradermal and serological tests with *Dirofilaria immitis* antigen in cases of human filariasis.” 24 (3), 203-208.

(81b) Wright & Murdock use an antigen extracted from *Dirofilaria immitis* for the identification of *Onchocerca volvulus* by means of the intradermal test, attempting to screen out non-specific reactions by using suitable dilution of the antigen. The patients had all suffered from *Onchocerca* infestation and some had other helminth and protozoan infections also. All patients gave positive reactions at a dilution of 1 : 2,000; 10 out of 11 gave positives at a dilution of 1 : 4,000. A proportion of the controls who harboured other helminths also gave positive results suggesting that part at least of the positive results were non-specific in character.

P.A.C.

(81c) Bozicevich & Hutter have used an antigen made from *Dirofilaria immitis* in attempts to diagnose human filariasis by means of the intradermal tests. There was an immediate reaction reaching its peak in 15 minutes and occasionally a delayed reaction which did not appear for several days. Dilution of 1 : 1,000 tended to give false positives, but a dilution of 1 : 1,200 gave more satisfactory results, while dilutions of 1 : 4,000 were still more satisfactory in eliminating false positives. A dilution as high as 1 : 8,000 seems to be of value in diagnosis.

P.A.C.

### 82—American Journal of Tropical Medicine. Supplement.

- a. MUMFORD, E. P. & MOHR, J. L., 1944.—“Manual on the distribution of communicable diseases and their vectors in the tropics. Pacific Islands section—Part I.” 24 (3), Supplement, 26 pp.

(82a) The helminth infections of the Pacific Islands recorded by Mumford and Mohr are ancylostomiasis, ascariasis, clonorchiasis, draconiasis, filariasis and elephantiasis, oxyuriasis, strongyloidiasis, taeniasis (*D. latum*, *H. nana*, *T. saginata* and *T. solium*), trichinosis, *Trichostrongylus* sp. and *Trichuris*.

R.T.L.

### 83—Anales del Instituto de Biología.

- a. BRAVO HOLLIS, M., 1944.—“Un tremátodo parásito del intestino de *Kinosternum integrum* procedente de Matamoros, Puebla.” 15 (1), 41-45.
- b. CABALLERO Y C., E., 1944.—“*Neodiplostomum paraspastula* Noble, 1936 (Trematoda : Diplostomidae) en un aguila de México.” 15 (1), 47-52. [English summary p. 52.]
- c. CERECERO D., M. C., 1944.—“Acerca de un tremátodo parásito de la ‘zarceta de alas azules’ *Querquedula discors*, del Lago de Texcoco, Méx.” 15 (1), 53-57. [English summary p. 57.]
- d. CABALLERO Y C., E., BRAVO H., M. & CERECERO, M. C., 1944.—“Estudios helmintológicos de la región oncocercosa de México y de la República de Guatemala. Trematoda I.” 15 (1), 59-72. [English summary p. 71.]
- e. LARIOS, I., 1944.—“Descripción de un céstodo del género *Hymenolepis* encontrado en los patos silvestres del Lago de Texcoco, Méx.” 15 (1), 73-78.
- f. CABALLERO Y C., E., 1944.—“Nemátodos de los reptiles de México. IX. Descripción de *Atractis impura* n.sp. y consideraciones acerca de las especies conocidas que parasitan a los reptiles.” 15 (1), 79-86. [English summary p. 85.]
- g. CABALLERO Y C., E., 1944.—“Estudios helmintológicos de la región oncocercosa de México y de la República de Guatemala. Nematoda: Ia Parte. Filarioidea. I.” 15 (1), 87-108. [English summary p. 106.]
- h. CABALLERO Y C., E., 1944.—“Acerca de la presencia de *Dirofilaria immitis* (Leidy, 1856) en un tejón silvestre de la región de Tuxtepec, Oax.” 15 (1), 109-114. [English summary p. 113.]

(83a) In her description of a single specimen of *Telorchis corti* Stunkard, from the small intestine of *Kinosternum integrum* from Mexico, Bravo Hollis points out differences in detail between this and previous descriptions of North American specimens from different Chelonia. N.G.S.

(83b) From several specimens of *Neodiplostomum paraspaula* from a new host, *Aquila chrysaetus*, from Mexico, Caballero finds a general agreement with previous descriptions, but some differences in detail: notably that the oral sucker is slightly greater than the acetabulum, and that there is no prepharynx. N.G.S.

(83c) Cerecero gives a redescription of *Hypoderæum conoideum* (Bloch) from *Querquedula discors* from Mexico. N.G.S.

(83d) Caballero et al. describe *Choledocystus intermedium* n.sp. a trematode parasite of the liver and gall bladder of *Bufo marinus* in the river Huixtla, Mexico. It can be recognized by the position of the cirrus sac and the relative positions of testes and uterus and by the distribution of the vitelline glands. They redescribe two mammalian trematodes *Rhopalias coronatus* and *R. macracanthus* both from the small intestine of *Didelphis mesamericana tabascensis*, amplifying the information already known. P.A.C.

(83e) Larios redescribes *Hymenolepis megalops* which he has collected from the rectum and cloaca of *Querquedula cyanoptera*, *Q. discors* and *Fulica americana* in Mexico. It appears to be a frequent parasite of these hosts. P.A.C.

(83f) Caballero describes *Atractis impura* n.sp., a nematode parasite of the large intestine of *Gopherus polyphemus* in Mexico. It can be recognized by the arrangement of the caudal papillae and by the chitinization and size of the spicules. He gives a key for the identification of the species of *Atractis* found in reptiles, and in so doing considers *A. cruciata* Linstow, 1902 to be a valid species, while *A. granulosa* and *A. morinae* seem to be synonyms of *A. fasciata*. P.A.C.

(83g) A group of filarial worms collected from man, and from wild and domesticated animals in S. Mexico, contained *Ochoterenella digiticauda* n.g., n.sp. from the peritoneal cavity of *Bufo marinus*. The microfilariae occur in the circulating blood. The genus resembles *Foleyella* but differs in the presence of caudal alae and in the structure of the spicules. The microfilariae have no sheath. *Diplotriaena* sp., from the pericardial cavity of *Cerchneis sparveria*, is also described, but the actual specific identity is not established. Detailed descriptions of *Onchocerca volvulus* from man, and *O. gutturosa* from cattle, are given. The adults are readily distinguished by differences in size, in the cuticular striations and in the size and structure of the spicules. P.A.C.

(83h) *Dirofilaria immitis* is reported from the pulmonary artery of *Nasua narica* in Oaxaca, Mexico. This appears to be a new host and geographical record for the species. P.A.C.

#### 84—Archivos Uruguayos de Medicina, Cirugía y Especialidades.

- a. PRAT, D. & PAIVA, P., 1944.—“Quiste hidatídico del hígado abierto en vías biliares y complicación de fractura patológica del fémur derecho.” *24* (4), 376-386.
- b. PRAT, D., 1944.—“Es posible la comprobación hidatídica de una colección supurada del hígado, después de la operación sólo por las reacciones biológicas?” *24* (4), 387-391.
- c. PRAT, D., 1944.—“La saculización hidatídica como agente de recidiva y de retardo en la curación del quiste hidatídico.” *24* (4), 392-395.

#### 85—Boletín de la Asociación Médica de Puerto Rico.

- a. ASENJO, C. F., 1944.—“Recent advances in the field of enzymatic anthelmintics.” *36* (5), 215-219.

(85a) Although vegetable enzymatic anthelmintics readily digest almost any species of intestinal parasite *in vitro* only a few are susceptible *in vivo*. The most effective are the milky exudates of several species of fig trees which have a specific action on the whipworm. Of other enzymatic anthelmintics, mention is made of papaya latex, pineapple juice, and maya juice, but there is still little exact knowledge concerning their clinical value. R.T.L.

## 86—Boletin de los Hospitales. Caracas.

a. PIÑA DAZA, M., 1944.—“Algo mas sobre Schistosomiasis mansoni.” *43* (1), 28-46.

(86a) Piña Daza describes the clinical course of disease in *Schistosoma mansoni* infestation. The disease may take one of two forms, haemorrhage and ascites, both involving changes in the liver: in one case the final picture is that of Banti's syndrome with pronounced splenomegaly; in the other the spleen is less markedly affected, but liver cirrhosis is even more intense. He describes in some detail the changes that occur in the viscera and the resulting effects on the function of the various parts. He is of the opinion that splenic changes are induced primarily by obstruction of the portal system by thrombi.

P.A.C.

## 87—Boletin del Instituto de Clinica Quirurgica. Universidad de Buenos Aires.

a. RIVAS, C. I., 1944.—“Consideraciones sobre equinococosis hidatídica del peritoneo.” *20* (164), 451-472.  
 b. TAIANA, J. A., 1944.—“Ensayo histórico sobre el tratamiento quirúrgico de la equinococosis en la República Argentina.” *20* (165), 529-539.

## 88—British Journal of Radiology.

a. BROCKLEBANK, J. A., 1944.—“Calcification in the guinea worm.” *17* (197), 163-164.

## 89—British Medical Journal.

a. HICKEY, M. D. & HARRIS, J. R., 1944.—“Definitive hosts of a species of *Diphyllobothrium* causing mass infection of trout in reservoirs. Preliminary note.” *Year 1944*, *2* (4365), 310.  
 b. UNSWORTH, K., 1944.—“Tapeworm in trout.” [Correspondence.] *Year 1944*, *2* (4367), 385.  
 c. HICKEY, M. D., 1944.—“Tapeworm in trout.” [Correspondence.] *Year 1944*, *2* (4370), 483.  
 d. O'CONNOR, N., 1944.—“Infestation by two types of tapeworm.” [Correspondence.] *Year 1944*, *2* (4378), 737.  
 e. BAYLIS, H. A., 1944.—“Tapeworm in trout.” [Correspondence.] *Year 1944*, *2* (4382), 868.

(89a) Hickey & Harris briefly record an epizootic due to plerocercoids in the trout of the Poulnaphuca reservoir, near Dublin, and that specimens ranging from typical plerocercoids to fully developed adults were present in the intestines of *Larus marinus*, *L. fuscus*, *L. argentatus*, and of *Phalacrocorax carbo*.

R.T.L.

(89b) Unsworth comments on the infestation of trout with *Diphyllobothrium* larvae reported by Hickey & Harris [see preceding abstract]. He feels that the evidence is insufficient to justify the conclusion that the adults found in the gull and cormorant were derived from the trout. He suggests also that the outbreaks recorded by Duguid & Sheppard [see Helm. Abs., Vol. XIII, No. 37a] may have involved two different species: one avian, the other mammalian.

R.T.L.

(89c) Hickey, replying to Unsworth [see preceding abstract] points out that in their investigations Hickey & Harris failed to infect a dog, whereas Duguid & Sheppard and Unsworth succeeded. Since this article was published Hickey & Harris have succeeded in infecting gulls and shag by feeding them with trout plerocercoids from the Dublin reservoir.

R.T.L.

(89d) A husband and wife, who lived on a hill overlooking five lakes which drain into a tributary of the River Erne, and consumed moderate amounts of perch, pike and eels, were both found to be infected with *Diphyllobothrium latum*. After treatment the woman passed 35 heads of *D. latum* and one head of *Taenia saginata*. She had an eosinophilia of 11%. The husband, whose blood showed no abnormality, passed strobila of *D. latum* 11 feet long without a head.

R.T.L.

(89e) Having made a preliminary examination of the materials investigated by Hickey & Harris, Unsworth, and Duguid & Sheppard [see above], Baylis is of opinion that all these investigators are dealing with a single form which is probably an old but little known species, *Diphyllobothrium dendriticum* (Nitzsch, 1824), normally a parasite of gulls. He thinks that certain

slight differences in the adults obtained experimentally in mammals as compared with those from gulls may be attributed to their development in abnormal hosts.

R.T.L.

**90—Bulletin. Pennsylvania Agricultural Experiment Station.**

a. THORP, W. T. S., 1944.—“Phenothiazine-salt mix prevents parasite infestations of sheep.” No. 446, Supplement 2 (Science for the Farmer), pp. 5 & 9.

(90a) Thorp has studied the value of phenothiazine in salt mixtures as a method of controlling nematodes in sheep. Of the various mixtures used a 1 to 9 proved the most efficient. Twenty Merino sheep which had had access to the mixture for 21 months showed no change in the red blood cell count or in the haemoglobin index. Unless the animals are previously drenched with phenothiazine the use of the mixture is said to be of doubtful value in a heavily infested flock.

R.T.L.

**91—Bulletin of the School of Medicine, University of Maryland.**

\*a. MILLETT, J., 1944.—“Trichinosis misdiagnosed as scarlet fever, with case reports.” 28 163-169.

**92—Bulletin of the United States Army Medical Department.**

a. RANDALL, R., 1944.—“Giant worms in kidney of dog.” No. 72, 9-10.  
 b. ANON, 1944.—“Early filariasis in American soldiers.” No. 76, 45-49.  
 c. ANON, 1944.—“Survey of filariasis in Puerto Rico.” No. 76, 49-51.  
 d. SCHNELLE, G. B. & YOUNG, R. M., 1944.—“Clinical studies on microfilarial periodicity in war dogs.” No. 80, 52-59.

(92a) Randall records the presence of *Diocophyllum renale* in the kidney of a dog which had died as a result of the infestation. The life-history is not known but apparently involves fish.

P.A.C.

(92b) A considerable number of American troops has acquired filarial infection in the Pacific Islands. The earliest onset was three months after arrival. The first symptoms were pain and swelling or redness of an arm (38%), leg (14%) or scrotal region (56%). The syndromes were lymphangitis of extremity or trunk, acute inflammation of the scrotum or its contents, and lymph node involvement. In 19.7% mild fever was present sometimes continuing up to six weeks. Antigen A, being 0.1% of a solution prepared from powdered *Dirofilaria immitis*, gave a positive result in 90.8% of 164 patients. Adult male and female filaria worms were recovered in 5 out of 17 biopsies. Although microfilariae apparently mature were present in the females none were found in the blood.

R.T.L.

(92c) Continental troops stationed in Puerto Rico were examined for filariasis as the disease is endemic in this area. No microfilariae were found in nocturnal circulating blood.

P.A.C.

(92d) The microfilariae of *Dirofilaria immitis* showed a periodicity, the count reaching its highest at 4.30 p.m. and reaching the low point at 9 p.m. The curve of periodicity was altered by changing the feeding routine of the dogs. An intravenous dose of epinephrine, which causes a reduction in the volume of the spleen, trebled the numbers in three minutes. Clamping the splenic artery also caused a marked increase. On an average over 8 months elapsed between the date of exposure to infection and the appearance of microfilariae in the peripheral blood.

R.T.L.

**93—Canadian Journal of Comparative Medicine.**

a. McINTOSH, R. A., 1944.—“Stomach worm disease in sheep.” 8 (8), 213.

(93a) Clinically the diagnosis of *Haemonchus contortus* is not difficult. There is always pronounced anaemia, the mucous membranes are white, and there is a loss of flesh and weight. The wool is dry and harsh. The skin is white. Often there is diarrhoea and the buttocks are smeared with faeces. In the more chronic cases there is oedema of the subcuticle tissue and swelling in the intermandibular space. The carcass appears devoid of blood. The abomasum is darker than other gastro-intestinal viscera due to haemorrhagic exudate. It is not to be confused with haemorrhagic septicaemia. Two tablets of phenothiazine per adult sheep and one

\* Titles so marked throughout this number have not been seen in the original.

per lamb, repeated a fortnight later if necessary, is recommended. A 1% copper sulphate solution given in 4 fluid ounce doses to adults and half that dose to lambs is also of great value. There should be a change of pasture after each treatment.

R.T.L.

#### 94—Canadian Journal of Public Health.

a. FALLIS, A. M., 1944.—“Resistance to *Ascaris lumbricoides* L. infection as demonstrated experimentally in guinea pigs.” [Abstract of paper given at the Christmas Meeting of the Laboratory Section [of the Canadian Public Health Association], Toronto, December, 1943.] 35 (2), 90.

(94a) An initial infection with eggs of *Ascaris lumbricoides* confers a degree of immunity on guinea-pigs which lasts for about three months but which reaches its peak about one to three weeks after ingestion of the eggs. The liver seems to act as a filter for the larvae in resistant animals. Resistance can be transferred passively to a small extent by means of the sera of a resistant animal.

P.A.C.

#### 95—Canadian Journal of Research. Section D. Zoological Sciences.

a. CHOQUETTE, L. P. E. & SWALES, W. E., 1944.—“Studies on factors influencing the health of pigs. II. The incidence of the roundworm (*Ascaris lumbricoides*) in pure-bred bacon pigs in Canada, with observations on age of susceptibility and effects on growth.” 22 (3), 53-59.

(95a) Choquette & Swales have examined young pigs for infestation with *Ascaris lumbricoides* in Canada, 75% of which carried an infestation at some time. Infestation reached a peak of 90% in the month of May, but there was no appreciable difference to be found between those kept outside and those kept enclosed in houses. Many of the animals had apparently acquired helminths during the nursing period. The evidence available was not sufficient to show if the presence of these helminths had affected the growth rate of the host.

P.A.C.

#### 96—Circular. California Agricultural Experiment Station.

a. DAY, L. H. & TUFTS, W. P., 1944.—“Nematode-resistant rootstocks for deciduous fruit trees.” No. 359, 16 pp.

(96a) This is a report on 15 years' work on the testing of various fruit tree root-stocks for resistance to the root-knot nematode. Apricot seedlings were almost immune, but unsatisfactory as stocks for peaches, plums and prunes. One myrobalan plum was found to be resistant and satisfactory as a stock. Several varieties of Marianna plum were also satisfactory. Results are given for 23 other species and varieties of plum. No really resistant almond seedlings were found. In tests with cherries, neither mazzard seedlings nor Stockton Morello roots developed galls, but mahaleb roots were lightly infected. Seedlings of 13 varieties of pear were studied for three years: 4 were lightly and 5 moderately attacked. Seedlings of Delicious and Rainier apples grown for one year in heavily infested soil were completely resistant. Four varieties of quince proved resistant during a two-year test. Walnut seedlings of Northern California and English varieties were lightly infested, but, once established, injury was slight. Seedlings of 180 varieties of peach and 44 of nectarine were tested. Most were highly susceptible, several were tolerant and the most promising were Shalil, Bokhara and Yunnan. Orchard tests as well as nursery tests are described and details are given of the method of top-working the resistant seedlings and of the germination of their seed and original source of the material.

M.T.F.

#### 97—Cornell Veterinarian.

a. MARTIN, A. R., 1944.—“The anthelmintic efficiency against sheep nematodes of copper-nicotine sulfate alone, and copper-nicotine sulfate in conjunction with phenothiazine in salt.” 34 (3), 241-247.

(97a) Nineteen ewes and their lambs were drenched monthly while on pasture with copper sulphate-nicotine sulphate and had access to pure salt. Thirty-nine ewes and their lambs were similarly treated on another pasture but in addition had free access to salt containing phenothiazine. In the latter group scours and diarrhoea and certain trichostrongyle

nematodes were significantly reduced and there was a lower incidence of oesophagostome nodules. There was no significant deviation from normal haemoglobin values in either group. The faecal counts indicated that the phenothiazine group had picked up less infection which is attributed to the inhibition of the first and second stage larvae on the ground. It was noticed that the sheep preferred the pure salt to the phenothiazine-salt mixture. R.T.L.

## 98—Current Science.

a. LAL, M. B., 1944.—“A new amphibian trichostrongylid.” **13** (4), 104-105.

(98a) Lal describes and figures *Oswaldocruzia (Oswaldocruzia) indica* n.sp. from the intestine of *Bufo melanostictus*. It differs from *O. filiformis* and *O. subauricularis*, its nearest congeners, in the shape of the spicules and dorsal ray, and in the smaller size of the eggs.

A.E.F.

## 99—Deutsche Medizinische Wochenschrift.

a. ENGEL, R. v., 1944.—“Geheilte *Strongyloides stercoralis*-Infektion.” **70** (13/14), 188-189.

(99a) Engel describes a case of *Strongyloides stercoralis* infection in a young woman in northern Hungary. Treatment with 1% gentian violet solution, introduced into the duodenum by means of a drip-tube, was carried out as follows: first day, 250 c.c. (of which 100 c.c. was vomited); second day, 100 c.c.; fifth day, 50 c.c.; sixth day, 100 c.c. The patient was kept under observation for a further week and, as both duodenal contents and faeces were negative for larvae, she was discharged. A.E.F.

## 100—Deutsche Tierärztliche Wochenschrift. Tierärztliche Rundschau.

a. ÜBERREITER, O., 1944.—“Onchozerkenbefunde bei Widerristfisteln des Pferdes.” [Abstract of paper presented to the Wiener Tierärztliche Gesellschaft, 1st March, 1944.] **†52/50** (15/16), 152.

(100a) Überreiter reports on eight cases of fistulous withers in horses in the excised tissues of which numerous *Onchocerca reticulata* were found. A.E.F.

## 101—East African Agricultural Journal.

a. NATTRASS, R. M., 1944.—“Note on the control of the root knot eelworm.” **10** (1), 43.

(101a) Chaffed Napier grass heavily applied in trenches to soil infected with *Heterodera marioni* and allowed to decompose enabled Nattrass to grow a normal crop of potatoes under glass. R.T.L.

## 102—East African Medical Journal.

a. MacGREGOR, G. A., 1944.—“Sternal puncture in hypochromic anaemia resulting from ankylostomiasis.” **21** (5), 134-143.

b. KAMMER, V., 1944.—“Fever in *Ancylostoma duodenale* infection on the upper Zambezi: a review of 93 cases.” **21** (7), 216-220.

c. FLEMING, A. McK., 1944.—“A case of intractable diarrhoea and high eosinophilia due to hookworm.” **21** (7), 221-222.

d. IRVINE, C., 1944.—“Intestinal obstruction due to roundworms.” **21** (7), 223.

(102a) Sternal puncture in 16 cases of severe hypochromic anaemia due to ankylostome infection showed that in the prevailing marrow picture there was a definite percentage increase in the incidence of early and of late erythroblasts and a lowering of the myeloid-erythroblastic ratio as well as a definite swing to the left in the maturation of the erythrocytes. MacGregor suggests that there is a deficiency of the extrinsic factor of the haemopoietic principle as well as an iron deficiency in ankylostomiasis. R.T.L.

† The first volume number is that of Deutsche Tierärztliche Wochenschrift and the second that of Tierärztliche Rundschau. Although the two journals are now issued as one, the volume number of each is retained.

## 103—Endeavour.

a. TAYLOR, E. L., 1944.—“The trend of British veterinary parasitology.” 3 (12), 150-155.

(103a) Dividing parasitology into “normal” and pathological and writing from the point of view of English veterinary medicine, Taylor states that the general trend of helminthological investigation is in the direction of epidemiology and that the field for the immediate future will doubtless be that of chemotherapy, of which the modern methods of investigation have scarcely been applied by veterinary parasitologists.

R.T.L.

## 104—Extension Circular. University of Arkansas College of Agriculture.

a. GIFFORD, R. & EVELETH, D. F., 1944.—“Common diseases and parasites of poultry.” No. 206, 44 pp.

(104a) In this bulletin dealing with disease in chickens is a section devoted to helminth parasites. The commoner parasites are mentioned with a brief account of their life-history and pathogenicity. Control measures are suggested and the usual treatment described. P.A.C.

## 105—Farmer and Stock-Breeder.

a. WIGHTMAN, R., 1944.—“Early fluke diagnosis saves sheep.” 58 (2855), 1012.

## 106—Farmers' Bulletin. U.S. Department of Agriculture.

a. HALL, M. C., DIKMANS, G. & WRIGHT, W. H., 1944.—“Parasites and parasitic diseases of sheep.” No. 1330, 49 pp. [Revision of 1938 edition.]

## 107—Field.

a. GORDON, M. D., 1944.—“Chicken rearing and treatment of gapes.” 183 (4762), 360.

(107a) In a popular article, Gordon briefly recalls the classical methods of dealing with gapeworm disease in chickens.

P.A.C.

## 108—Gardeners' Chronicle.

a. HOWARD, A., 1944.—“Cause and cure of the potato eelworm.” 115 (2983), 90.

(108a) Howard states dogmatically “Freshly prepared humus from vegetable and animal wastes is the cheapest and most effective method of controlling the potato eelworm”. “Infection appears when the compound soil particle has been destroyed.” This, he believes, is the “result of a continuous use of artificial manures”.

R.T.L.

## 109—Indian Farming.

a. JOB, T. J., 1944.—“Public health fish farming.” 5 (1), 10-13.

(109a) Among the recommendations in this paper is one on the use of “glass fishes” for the destruction of the cyclops intermediaries of guinea-worm. The local names for these fishes in different parts of India are given.

R.T.L.

## 110—Indian Medical Gazette.

a. McROBERT, G. R., 1944.—“Somatic taeniasis. (Solium cysticercosis).” 79 (9), 399-400.

(110a) A cultivator from the Ramnad district with thousands of slippery, blubbery swellings like soft peas on the face, neck, shoulders, thighs and hips was radiographed with negative results. Six of the swellings were excised and proved to be *Cysticercus cellulosae*. While in hospital the patient had two epileptiform seizures. In spite of repeated dosing with male fern no evidence of *Taenia solium* infection was obtained.

R.T.L.

## 111—Indian Medical Record.

a. SINGH, B., 1944.—“A case note on tape worm.” 64 (2), 43-44.

(111a) It is recorded that a patient coughed up a portion of tapeworm.

R.T.L.

## 112—Indian Veterinary Journal.

- a. RAO, B. MOHAN, 1944.—“Nasal granuloma—its treatment under field conditions.” **21** (1), 43–44.
- b. RAO, B. MADHAVA, 1944.—“A brief account of the life cycle of *Limnaea acuminata* and *Indoplanorbis exustus* as observed in Nizamsagar area.” **21** (2), 76–79.
- c. BELLIAPPA, A. B., 1944.—“On a species of *Clinostomum* in a cat.” **21** (2), 101–102.

(112a) Usually six daily intravenous injections of tartar emetic cure granuloma due to *Schistosoma spindalis* in cattle. Rao finds that the treatment can be discontinued after the fifth injection if these are given intermittently every second or third day. Although there is no immediate improvement all symptoms disappear within about a month after the last injection.

R.T.L.

(112c) A large number of “papillomatous outgrowths” about half an inch in length under the tongue of a cat on either side of the frenum were identified as a species of *Clinostomum*.

R.T.L.

## 113—Journal of the American Medical Association.

- a. RUBIN, S. S., 1944.—“Creeping eruption.” [Correspondence.] **124** (10), 668.
- b. APPLEBAUM, I. L. & WEXBERG, L. E., 1944.—“Eosinophilia in cerebrospinal fluid.” **124** (13), 830–831.
- c. VON HOFE, F. H., 1944.—“An improved method of demonstrating ova of *Enterobius vermicularis*.” **125** (1), 27.
- d. BROWN, H. W., 1944.—“The treatment of filariasis (*Wuchereria bancrofti*) with lithium antimony thiomalate.” **125** (14), 952–958.
- e. BERCOVITZ, Z. T., RODRIGUEZ-MOLINA, R., HARGRAVE, D. W., DICKIE, J. D. & GREEN, C. E., 1944.—“Studies on human *Schistosoma mansoni* infections. I. Proctoscopic picture in asymptomatic Schistosomiasis mansoni infections.” **125** (14), 961–963.

(113a) A case of creeping eruption in which there were 32 distinct active tracts is reported to have been successfully treated by 5 c.c. injections of Fouadin given daily on 6 successive days: after a rest of one week the injections were increased to 7 c.c. and continued for another five days.

R.T.L.

(113c) For examining a patient for *Enterobius*, Von Hofe uses a piece of Scotch tape stretched over the round end of a test tube. The tube, with adhesive surface exposed, is rocked firmly over the anus to obtain a smear, after which it is transferred to a slide and examined. Very good results are obtained in positive cases.

P.A.C.

(113d) Lithium antimony thiomalate (anthiomaline), given intramuscularly to a series of 25 Virgin Island patients with *Wuchereria bancrofti* infection, reduced the count of microfilariae in the peripheral blood by 85% to 100%. There was no reduction in the enlarged lymphatic glands. Vomiting, joint pain, fever and rash due to the drug were not considered sufficiently serious to preclude its uses. The dose given to an adult was 3 c.c. of a 6% solution, 1 c.c. containing 60 mg. of lithium antimony thiomalate or 10 mg. of antimony.

R.T.L.

## 114—Journal of the American Veterinary Medical Association.

- a. SWANSON, L. E., 1944.—“The effect of phenothiazine on horses.” **105** (810), 134–135.

(114a) Thirty grammes of phenothiazine mixed with oats and given after food had been withheld for 18 hours was highly efficient in removing *Strongylus* spp. from 65 mature horses. No unusual reactions were observed. The horses were worked on the third day after treatment.

R.T.L.

## 115—Journal of the Department of Science, Calcutta University.

- a. CHAKRAVARTY, G. K., 1944.—“On the nematode worms in the collection of the Zoological Laboratory, University of Calcutta. Part I.—Families Heterakidae and Kathlaniidae.” New Series, **1** (4), 70–77.

(115a) Chakravarty describes *Africana mabuya* n.sp. from the intestine of *Mabuya carinata*. The relationship of the new species to other members of the genus is discussed, and the diagnosis of *Africana* is emended. *Heterakis bosia* is reported from *Tragopan satyra*. *Spironoura falcata*, from the intestine of *Rana hexadactyla*, is described in detail, and *S. brevispiculata* Baylis, 1935, reduced to the synonymy of *S. falcata*.

A.E.F.

## 116—Journal of Economic Entomology.

- a. ENGLISH, L. L., 1944.—“Dowfume to kill nematodes in potting soil.” 37 (2), 307.
- b. CHAMBERLIN, T. R., 1944.—“Observations on nematodes associated with white grubs.” 37 (2), 313-314.

(116a) The mixture Dowfume Br.-10, composed of methyl bromide, carbon tetrachloride and ethylene dichloride, has been used successfully as a soil fumigant for potting soil after an exposure period of 90 hours. Gardenias were planted immediately thereafter. After six months these showed no root infection with *Heterodera marioni* whereas infection was easily found in controls in untreated infected soil.

R.T.L.

(116b) Chamberlin records the occurrence of nematodes in association with white grubs, i.e. larvae of *Phyllophaga* spp. The specific identity of the nematodes was not determined but it seems probable that they were some species of *Diplogaster*. The infective larvae appear to attach themselves principally to the head region of the grubs where they may attack some of the tissues and so perhaps hasten the death of the grubs. When this has taken place the nematodes reproduce in the dead carcase.

T.G.

## 117—Journal of Infectious Diseases.

- a. OLIVER-GONZÁLEZ, J. & TORREGROSA, M. V., 1944.—“A substance in animal parasites related to the human isoagglutinogens.” 74 (3), 173-177.
- b. KRAKOWER, C., HOFFMAN, W. A. & AXTMAYER, J. H., 1944.—“Defective granular eggshell formation by *Schistosoma mansoni* in experimentally infected guinea pigs on a vitamin C deficient diet.” 74 (3), 178-183.

(117a) A polysaccharide fraction has been isolated from pulverized dried *Ascaris lumbricoides*, *Trichinella spiralis*, *Necator americanus*, *Schistosoma mansoni* and *Cysticercus cellulosae*. When added to human serum the  $\alpha$  and  $\beta$  agglutinins were inhibited. Haemolysis of sheep cells in a system consisting of Forssman antiserum, sheep cells and guinea-pig complement was also inhibited.

R.T.L.

## 118—Journal of Parasitology.

- a. HARWOOD, P. D. & GUTHRIE, J. E., 1944.—“The effect of nicotine-bentonite and of certain physical states upon the efficacy of phenothiazine against nematodes in fowls.” 30 (3), 143-152.
- b. FUJII, H., 1944.—“Three monogenetic trematodes from marine fishes.” 30 (3), 153-158.
- c. CHEN, H. T., 1944.—“*Spelotrema pseudogonotyla* n.sp. (Trematoda: Microphallidae) from Hongkong.” 30 (3), 159-161.
- d. WITENBERG, G., 1944.—“*Transversotrema haasi*, a new fish trematode.” 30 (3), 179-180.
- e. NIGRELLI, R. F. & MARAVENTANO, L. W., 1944.—“Pericarditis in *Xenopus laevis* caused by *Diplostomulum xenopi* sp. nov., a larval strigeid.” 30 (3), 184-190.
- f. MARTIN, W. E., 1944.—“*Cercaria solemyae* n.sp., probably a blood fluke, from the marine pelecypod, *Solemya velum*.” 30 (3), 191-195.
- g. HARWOOD, P. D. & GUTHRIE, J. E., 1944.—“The effect of prickly-ash bark upon the efficacy of phenothiazine against nematodes in fowls.” 30 (3), 197.
- h. YETWIN, I. J., 1944.—“A simple permanent mounting method for *Necator americanus*.” 30 (3), 201.
- i. REINHARD, E. G., 1944.—“A hermit crab as intermediate host of *Polymorphus* (Acanth.).” 30 (3), 201.
- j. ADDIS, C. J. & CHANDLER, A. C., 1944.—“Studies on the vitamin requirement of tapeworms.” 30 (4), 229-236.
- k. DAVIS, H. E., 1944.—“*Cittotaenia sandgroundi*, a new anoplocephalid cestode from a Javanese tree duck.” 30 (4), 241-244.
- l. WITENBERG, G. & GERICHTER, C., 1944.—“The morphology and life history of *Foleyella duboisi* with remarks on allied filariids of Amphibia.” 30 (4), 245-256.
- m. AMEEL, D. J., 1944.—“The life history of *Nudacotyle novicia* Barker, 1916 (Trematoda: Notocotylidae).” 30 (4), 257-263.
- n. ANDERSON, D. J., 1944.—“Studies on *Cercaria szidati* sp. nov., a new furcocercous cercaria of the Vivax type.” 30 (4), 264-268.
- o. TODD, A. C., 1944.—“Two new nematodes from the aquatic beetle *Hydrous triangularis* (Say).” 30 (4), 269-272.
- p. CHANDLER, A. C., 1944.—“A new species of *Mesocestoides*, *M. kirbyi*, from *Canis latrans*.” 30 (4), 273.

†q. VAN CLEAVE, H. J. & ROSS, E. L., 1944.—“Physiological responses of *Neoechinorhynchus emydis* (Acanthocephala) to various solutions.” 30, Supplement p. 7.

†r. THRELKELD, W. L., 1944.—“Further notes on *Chabertia ovina*.” 30, Supplement p. 7.

†s. SEITNER, P. G., 1944.—“Studies on a new xiphidiocercaria of the *Virgula* type with notes on the life history.” 30, Supplement p. 7.

†t. CABLE, R. M. & MCLEAN, R. A., 1944.—“Motion picture of *Cercaria clausii* Monticelli, a marine rattekkönig larval trematode from the west coast of Florida.” 30, Supplement p. 7.

†u. PRICE, E. W. & MCINTOSH, A., 1944.—“Paramphistomes of North American domestic ruminants.” 30, Supplement p. 9.

†v. TSUCHIYA, H. & RELLER, H., 1944.—“A case of *Trichostrongylus* sp. with notes on the identification of ova.” 30, Supplement p. 10.

†w. LUCKER, J. T. & NEUMAYER, E. M., 1944.—“The production of anemia in lambs by hookworms, *Bunostomum trigonocephalum*.” 30, Supplement p. 10.

†x. OTTO, G. F., ALLEN, E. & BRACKETT, S., 1944.—“The action of negro and white sera on infective hookworm (*Necator americanus*) larvae.” 30, Supplement p. 11.

†y. NEWTON, W. L. & WRIGHT, W. H., 1944.—“Tests to determine the ability of species of domestic mosquitoes to transmit *Wuchereria bancrofti*.” 30, Supplement p. 11.

†z. CULBERTSON, J. T. & ROSE, H. M., 1944.—“Agglutination of microfilariae from *Litomosoides carini* of the cotton rat by normal serums.” 30, Supplement pp. 11-12.

†ba. OLIVER-GONZALEZ, J., 1944.—“Cross reactions between polysaccharides from various animal parasites.” 30, Supplement p. 12.

†bb. REID, W. M., 1944.—“The effects of host starvation on worm elimination and glycogen depletion with the nematode *Ascaridia galli*.” 30, Supplement p. 12.

†bc. ACKERT, J. E., BRANSON, D. S., AMEEL, D. J. & RIEDEL, B. B., 1944.—“Substitution of soybean oil meal for animal protein in developing resistance of animals to parasitism.” 30, Supplement pp. 12-13.

†bd. ACKERT, J. E. & WISSEMAN, JR., C. L., 1944.—“Studies on effects of helminths on growing chickens.” 30, Supplement p. 13.

†be. MAYHEW, R. L., 1944.—“The effects of nematode infections during the prepatent period on the calf.” 30, Supplement p. 13.

†bf. LARSH, JR., J. E., 1944.—“Alcoholism in mice and its effect on natural and acquired resistance to *Hymenolepis nana* var. *fraterna*.” 30, Supplement pp. 13-14.

†bg. OLSEN, O. W., 1944.—“Critical tests with a hexachlorethane-bentonite-water suspension as a fasciolicide in cattle.” 30, Supplement p. 14.

†bh. McMULLEN, D. B., VAN VOLKENBERG, H. L. & HARWOOD, P. D., 1944.—“Common names of helminths.” 30, Supplement p. 14.

†bi. SMITH, V. S., 1944.—“A reaction of rat serum to embryonated eggs of *Trichosomoides crassicauda*.” 30, Supplement p. 14.

†bj. SMITH, V. S., 1944.—“Studies on the relationship of *Trichosomoides crassicauda* infection in rats to mucoid calculi of the urinary bladder.” 30, Supplement pp. 14-15.

†bk. LUTTERMOSER, G. W., 1944.—“The possibility of eliminating the schistosome snail, *Australorbis glabratus*, from canals by control of water flow.” 30, Supplement p. 15.

†bl. WALTON, A. C., 1944.—“The parasites of the Plethodontidae (Amphibia—Caudata) III.” 30, Supplement p. 15.

†bm. WALTON, A. C., 1944.—“The parasites of the Plethodontidae (Amphibia—Caudata) IV.” 30, Supplement pp. 15-16.

†bn. WALTON, A. C., 1944.—“The parasites of the Proteidae and the Sirenidae (Amphibia—Caudata).” 30, Supplement p. 16.

†bo. SPINDLER, L. A. & ZIMMERMAN, JR., H. E., 1944.—“Effect of skim milk on infections of ascarids, whipworms, and nodular worms in swine.” 30, Supplement p. 16.

†bp. ROSE, H. M., CULBERTSON, J. T. & MOLLOY, E., 1944.—“An *in vitro* method for the bio-assay of chemotherapeutic agents in filariasis.” 30, Supplement pp. 16-17.

†bq. BROWN, H. W., 1944.—“The present status of the filariasis problem.” 30, Supplement pp. 17-18.

†br. SCHWARTZ, B., 1944.—“Parasites as factors in production of meat and other animal products in wartime.” 30, Supplement p. 18.

(118a) Harwood & Guthrie find that a mixture of phenothiazine and nicotine bentonite is effective in removing Ascaridia and Heterakis from chickens. A dose of 0.5 gramme phenothiazine is efficient and non-toxic. Other nicotine preparations prove to be much more toxic than the bentonite, but they find that the physical state of the phenothiazine does not alter its efficiency—the finely-ground substance is no more effective than the coarsely-ground. P.A.C.

(118b) Fujii describes three Monogenea from the gills of Tortugas fishes: *Hexostoma macracanthum* n.sp., from *Euthynmus alleteratus*, which is most like *H. euthynni*, differing mainly

† Abstract of a paper prepared for the 19th Annual Meeting of the American Society of Parasitologists, Cleveland, Ohio, September 11-12, 1944.

in the proportionate sizes of the posterior pair of suckers and the form of their skeleton, also in the very short anterior filament of the egg. The anchors are relatively larger than in any of the other species. *Cyclocotyla hysteroncha* n.sp., on *Bathystoma striatum* (type host), *Brachygenys chrysargyreus* and *Haemulon flavolineatum*, is characterized by having only 6 or 7 testes, a relatively large pharynx, and a minute terminal lappet bearing anchors with sickle ends. *Choricotyle reynoldsi* Frayne, is here transferred to the genus *Neoheterobothrium* Price. *Microcotyloides incisa* (Linton) is redescribed from the type host, *Lutjanus griseus*, and made the type of a new genus which is distinguished from *Microcotyle* by the vaginal pore being on the right margin, and in having rod-like prostatic vesicles on either side of the prostatic bulb and chitinous penis.

N.G.S.

(118c) *Spelotrema pseudogonotyla* n.sp. is described by Chen from the intestine of domestic duck in Hongkong and Canton; it is distinguished from other species by the muscular organ, the pseudogonotyl, at the base of the male papilla, guarding the entrance to the genital pore. He considers the presence of a pseudogonotyl may prove to be a generic character of primary importance.

N.G.S.

(118d) A unique digenetic trematode, *Transversotrema haasi* n.g., n.sp. (placed in *Transversotreminae* n.subf.) is described by Witenberg from an unknown Red Sea fish. In its transversely elongated form it resembles only *Moreauia mirabilis* Johnston, to which it bears no relation. The mouth (without oral sucker) is in the centre of the body immediately above the acetabulum, and the intestine is a continuous transverse loop surrounding two opposite dendritic testes, a lobed ovary, and a W-shaped uterus which, with the vas deferens, opens into the genital atrium in the middle of the anterior margin of the body. The surface is covered with broad blunt spines. In some respects it recalls *Mesometridae*, but it is thought to represent a new family.

N.G.S.

(118e) Heavy infections of 25 to 150 metacercariae of *Diplostomulum xenopi* n.sp. in the pericardium of *Xenopus laevis* were found by Nigrelli & Maraventano to be a cause of death. They are unencysted and excite a hypersecretion of fluid, the pressure of which causes a vicious series of pathological responses. There was no ill effect from an infection of 1 to 3 worms. The presence of lateral suckers and a tribocytic organ distinguish it from other members of the genus *Diplostomulum*, in which it is placed provisionally.

N.G.S.

(118f) Martin considers that *Cercaria solemyae* n.sp. may belong to Aprocotylidae because neither sucker is developed and there are groups of spines along the sides of the body. Gut-pouches are present, but it differs from all other known cercariae of this family in the very small pointed tail, which is not forked. Daughter sporocysts contain not more than 5 cercariae. Pathological changes in the digestive gland and gonad of the host, due to the presence of the ovoid or spherical sporocysts, are described.

N.G.S.

(118g) The efficiency of phenothiazine against nematodes in chickens does not seem to be altered by the addition of a gramme of bark of *Xanthoxylum Clavo-Herculis*. P.A.C.

(118h) For permanent mounts of small nematodes and their ova, Yetwin uses 10% bacto-glycerin (granular) 150 c.c., glycerin 50 c.c., 1% chromium and potassium sulphate (granular) 100 c.c., phenol (liquid) 1 c.c. The gelatin is dissolved in boiling water, the glycerin is added. After mixing, the chrome alum solution and phenol are added. The medium gels but liquifies in 15 minutes at 65°. Specimens may be mounted in this medium from glycerin or formalin solutions and the preparation hardens into a permanent mount.

R.T.L.

(118i) Encysted larvae of the acanthocephalan genus *Polymorphus* have been found by Reinhard in the abdominal cavity of *Pagurus longicarpus* at Woods Hole. Usually a single oval glistening white cyst is present and this is visible through the cuticle. The infection rate was about 1%.

N.G.S.

(118j) Addis & Chandler find that the development of the cysticerci of *Hymenolepis diminuta* in rats is dependent in part on the vitamin G complex of the host. In the absence of this complex, establishment of the larvae becomes difficult and there is considerable stunting of the larvae which do appear. Absence of vitamins A, D, E and B<sub>1</sub> in the diet of the host has no

inhibitory effect on the establishment of larvae and the parasites themselves grow more rapidly than in the fully fed controls. It is suggested that the parasite can synthesize most vitamins, but must absorb vitamin G from the host.

P.A.C.

(118k) Davis describes *Cittotaenia sandgroundi* n.sp. from *Dendrocygna javanica* in Java. It is distinguished from all other species of the genus by the presence of a rostellum and by the small number of testes: there are never more than four.

P.A.C.

(118l) *Foleyella duboisi* is a common filaria in *Rana esculenta ridibunda* from Lake Huleh in Palestine. In some samples the infection rate reaches 50%, yet this parasite has hitherto been recorded only once and on that occasion from the Belgian Congo. Except for the number of oral papillae the Palestinian specimens agree with Gedoelst's original description. The microfilariae, which are sheathed, have been developed experimentally in *Culex molestus*. About 35% of the mosquitoes used became infected. The infective stage is reached in 14 days. Sixteen species of the genus *Foleyella* are listed. In Amphibia there are 3 species of the genus *Icosiella*, and in addition to these the authors give a list of 31 records of undeterminable or insufficiently described filariae.

R.T.L.

(118m) *Cercaria marilli* Ameel, occurring in rediae in *Pomatiopsis lapidaria*, forms metacercariae in discoid cysts either on the water film or on vegetation. These were fed by Ameel to a variety of laboratory raised animals, but only developed in the small intestine of *Ondatra zibethica* and in the bile ducts of *Microtus pennsylvanicus* and *Synaptomys cooperi* (the latter though allied to, and co-extensive with, infected wild *Microtus*, was not confirmed as a natural host). The adult worms were identified as *Nudacotyle novicia* Barker, those from *Microtus* differing only from the typical specimens from *Ondatra* in having tapering posterior ends (instead of being truncated) and in their larger average size. Mother sporocysts developed along the intestine of the snails 14 days after feeding with eggs, and in 3 weeks all snails infected had mother rediae either on the anterior part of the intestine or in the digestive gland. Daughter rediae did not develop in the laboratory. Eggs failed to hatch *in vitro* and the miracidium was not seen.

N.G.S.

(118n) *Cercaria szidati* n.sp. was found in sausage-shaped sporocysts in the mantle region of *Campeloma* sp. by Anderson in Indiana. It is most like the cercaria of *Linstowiella viviparae* (and like the related *C. kentuckiensis* lacks furcal fin folds), differing in details, including its inability to encyst in the molluscan host. Cercariae lived for 12 to 24 hours. Owing to overlapping of characters shown by these cercariae, the subgroups Vivax and Tetis are combined, leaving only Vivax and Tauiana, with and without flame cells in the tail respectively. Other relationships are discussed.

N.G.S.

(118o) Todd describes two new species of the genus *Pseudonymus*, both from *Hydrops triangularis* in Nebraska and Louisiana. This is the first time this genus has been recorded from the United States. *P. brachycercus* n.sp. from the large intestine resembles *P. hydrophili*, a species which however is incompletely described. *P. leptocercus* n.sp., also from the large intestine, is small and has a filiform tail. Only females are known in each case.

P.A.C.

(118p) Chandler describes *Mesocestoides kirbyi* n.sp. from the intestine of *Canis latrans* in California. It can be distinguished by the possession of from 100 to 120 testes. The gravid segments assume a curious bell shape.

P.A.C.

(118q) Van Cleave & Ross examined the effects of different sodium chloride concentrations on the turgidity and *in vitro* life of *Neoechinorhynchus emydis*. In a 0.85% solution worms became excessively wrinkled and lived longest (15 days), becoming turgid on the 13th day. The effects on turgidity were confirmed *in vivo* by administering solutions to the host *per os*.

W.P.R.

(118r) Threlkeld produced symptoms of parasitic disease in lambs by experimental infection with *Chabertia ovina*; these included loss of weight, bloody diarrhoea, and a fall in haemoglobin and number of red cells.

P.A.C.

(118s) Seitner finds that 30% of *Goniobasis depygis* from Indiana harbour small oval sporocysts yielding a new stylet cercaria of the Virgula type. The body is spinose with longer

spines near the mouth, but the simple tail is aspinose: there are 3 pairs of cephalic glands, the large virgula organ is apparently trilobed, and the excretory vesicle is U-shaped. Cercariae penetrate and encyst in may-fly naiads, developing into metacercariae similar to the natural infections. These have lecithodendriid-characters similar to those of *Loxogenes bicolor*, which occurs in frogs in the same stream.

N.G.S.

(118t) By means of a motion picture Cable & McLean have shown that *Cercaria clausii* sometimes swim together as a unit, contracting simultaneously and sometimes showing independent efforts to detach themselves from the rosette.

N.G.S.

(118u) In the United States *Paramphistomum cervi* is relatively rare in cattle. *P. liorchis* occurs in cattle and is common in deer in Florida and Louisiana. *P. microbothrioides* n.sp. is common and widely spread in cattle. It possesses only 6 to 9 irregularly spaced units in the dorsal external acetabular muscle fibres as compared with about 25 regularly spaced units in *P. microbothrium*. The form identified by Krull as *Cotylophoron cotylophorum* belongs to this species.

R.T.L.

(118v) A few eggs of an unidentified species of *Trichostrongylus* were found in human faeces. The eggs were grape-shaped with 16 to 24 cells when freshly passed, and measured 81 to 97 microns  $\times$  40 to 51 microns.

R.T.L.

(118w) Lucke & Neumayer have successfully infected lambs with *Bunostomum* by the percutaneous route, using 50,000 and 112,000 larvae. The adults recovered at autopsy numbered 1,500 and 2,000 respectively. Anaemia developed. Two lambs infected with over 500,000 larvae only became lightly infected.

P.A.C.

(118x) Using precipitin reaction with hookworm larvae in human sera, negroes seemed to react more strongly than did whites in an endemic area.

P.A.C.

(118y) In addition to *Culex quinquefasciatus*, four other species of mosquitoes in the United States developed infective or potentially infective larvae when fed experimentally on a case of *Wuchereria bancrofti*, viz., *Anopheles albimanus* 67%, *Psorophora confinis* 12%, *Culex nigripalpus* 6.8%, *Aedes aegypti* 4.9%. The salt marsh species *Aedes sollicitans* and *A. taenio-rhynchus* gave negative results.

R.T.L.

(118z) Human serum and rabbit serum seem to have the power of agglutinating the microfilariae of *Litomosoides carinii* within ten minutes. Sera from rats and cotton rats did not have this effect.

P.A.C.

(118ba) Oliver-González reports that polysaccharide fractions isolated from different nematodes, trematodes and a cestode had common antigenic properties, inhibiting the  $\alpha$  and  $\beta$  isoagglutinins of human serum and giving similar precipitin titres with antisera from rabbits immunized with any of the polysaccharide fractions.

W.P.R.

(118bb) Reid found that 48 to 96 hours starvation of the host led to the elimination of *Ascaridia galli*. During starvation the glycogen content of the worms fell rapidly to 0.46% after 48 hours. Extreme glycogen depletion was correlated with and possibly responsible for the elimination of the parasites.

W.P.R.

(118bc) The addition of soya bean flour to the ration of chickens does not significantly affect their resistance to infestation with *Ascaridia galli*.

P.A.C.

(118bd) Ackert and Wisseman show that small numbers of *Ascaridia galli* and of *Raillietina cesticillus* do not seem to have much effect on the general well-being of chickens.

P.A.C.

(118be) Mayhew has obtained evidence in support of the view that the pre-adult stages of *Haemonchus contortus* and *Oesophagostomum radiatum* are pathogenic and reduce the rate of gain in weight of calves experimentally infected.

R.T.L.

(118bf) Alcoholic intoxication seems to affect the mechanism of natural resistance of mice to infestation with *Hymenolepis nana* var. *fraterna* but has no effect on the immune state.

P.A.C.

(118bg) Cattle can tolerate doses of 100 grammes of hexachlorethane, a drug which seems to be effective against *Fasciola hepatica*. Cattle in average condition can tolerate twice the dose.

P.A.C.

(118bh) A list of common names of helminths is being compiled, after consultation with other scientists, by a committee of the American Society of Parasitologists. R.T.L.

(118bi) A precipitate forms round eggs of *Trichosomoides crassicauda* in sera from infested rats. No precipitate forms round hatched larvae. P.A.C.

(118bj) In wild rats several vesical calculi were found to have formed in association with *Trichosomoides crassicauda*. They seem to be composed largely of mucin and occur mainly in male animals. Calculi also formed in non-infested animals, so that it is doubtful if the helminth was the primary cause of their occurrence. P.A.C.

(118bk) Using wooden and concrete canals, Luttermoser finds that *Australorbis glabratu*s is carried away in 10 to 30 minutes when the flow is 0.38 to 0.42 metres per second. R.T.L.

(118bl & bm) In Part 3 of this series Walton cites as helminth parasites of the Plethodontidae one acanthocephalan, two trematodes and three nematodes, two of which, " *Oxyuris* " *dubia* and *Oxysomatium brevicaudatum*, are of doubtful authenticity. There are five metacercariae and two larval cestodes. In Part 4 Walton cites three nematodes, two of them being rather doubtful, one acanthocephalan, one adult cestode and two larval cestodes, only one of which has been definitely diagnosed. Protozoan, acarine and annelid parasites are also listed. The parasites are arranged under the host name. P.A.C.

(118bn) Two hosts belonging to the Proteidae are cited as carrying three nematode species, two cestodes and nine trematode species. Most of the flatworm records are of doubtful validity. The helminth parasites of *Siren lacertina*, of the Sirenidae, apparently number three nematodes and nine trematodes, of which four are larvae. Some geographical information is given but no authors' records. P.A.C.

(118bo) [For abstract of this paper see Helm. Abs., Vol. XIII, No. 55b.]

(118bp) Rose et al. report that the adults and microfilariae of *Litomosoides carinii* can be maintained in sterile salt-dextrose media for one week at 37°C. Anthelmintics to be tested are added to the media. [Methods of estimating worm mortality are not mentioned.] The action of neostam and neostibosan so examined was similar to that found *in vivo*. W.P.R.

(118bq) The only endemic focus of filariasis in the United States has apparently disappeared. This was in Charleston. There is however now a danger of new foci appearing after the return of American troops from the Pacific Islands. R.T.L.

(118br) Wartime needs draw attention to the damage to the nation's material needs by helminths, particularly *Oesophagostomum columbianum*, *Fasciola hepatica*, *Fascioloides magna*, *Cysticercus tenuicollis* and *Thysanosoma actinoides*. R.T.L.

## 119—Journal of Pharmacology and Experimental Therapeutics.

a. CULBERTSON, J. T. & ROSE, H. M., 1944.—"Chemotherapy of filariasis in the cotton rat by administration of neostam and of neostibosan." 81 (2), 189-196.

(119a) Culbertson & Rose find that infestations of *Litomosoides carinii* in rats can be successfully treated by means of repeated injections of neostam and of neostibosan. Adult worms are highly susceptible to the drugs as is evidenced by both *in vitro* and *in vivo* experiments. In treated animals microfilariae gradually disappear from the blood and autopsy shows the adults to have been killed. P.A.C.

## 120—Journal of the South African Veterinary Medical Association.

a. MÖNNIG, H. O., 1944.—"Phenothiazine—a brief summary of knowledge to date." 15 (2), 70-72.

(120a) Mönnig summarizes present knowledge of phenothiazine and gives its dosage and efficacy for horses, sheep and goats, cattle, pigs, and fowls. He considers the drug to be economic for horses, but not for sheep and goats under conditions requiring regular and frequent dosing. It is suggested that " it may be very useful to give sheep one large dose (50 grammes for 100% effect against nodular worms) annually at the end of winter, in the

summer rainfall area, to prevent infection of the pasture the next spring". In South Africa pigs suffer mainly from Ascaris infection, and chenopodium oil gives better results. A.E.F.

**121—Journal of the Tennessee Academy of Science.**

a. CALHOUN, J. B., 1944.—"Twenty-four hour periodicities in the animal kingdom. Part I. The invertebrates." **19** (2), 179-200.

(121a) In the course of this paper Calhoun deals very briefly with filarial periodicity. A.E.F.

**122—Journal of Tropical Medicine and Hygiene.**

a. NEUMANN, H., 1944.—"Filariasis in the white man." **47** (3), 25-28.

(122a) Many white patients who have lived many years in endemic areas of filariasis show no clinical symptoms although there are microfilariae in their blood. Early filariasis Neumann describes under three types: (i) allergic, (ii) streptococcal superinfection, and (iii) staphylococcal superinfection. Type (i) does not require treatment, type (ii) responds to sulphonamide, and type (iii) responds to treatment by simple incision and insertion of a wick. Late filariasis may call for surgical treatment as in hydrocele and localized elephantiasis of scrotum and penis.

R.T.L.

**123—Journal of the Washington Academy of Sciences.**

a. MANTER, H. W., 1944.—"Notes on the trematode subfamily Loimoinae (Monogenea), with a description of a new genus." **34** (3), 86-89.

(123a) After a re-examination of the original material of the monotypic genera *Loimos* and *Tricotyle*, Manter decides that they are congeneric. The genotype, *L. salpingoides*, is found to have a file-like edge to the two dorso-lateral cuticularized ridges on the haptor, an inconspicuous vagina, a bipartite pharynx, and eight or nine tandem testes. The other species becomes *L. scoliodoni* (Manter). A related form from the gills of *Sphyrna zygaena* is made the type of a new genus, *Loimosina wilsoni* n.g., n.sp., characterized by the oral sucker having three pairs of loculi, the haptor two anchors and numerous hooks, a massive lobed testis, a reduced cirrus, a conspicuous vagina, and a branched tubular ovary. The subfamily Loimoinae is redefined and its relations with other Monocotylidae discussed.

N.G.S.

**124—Lancet.**

a. LANE, C., 1944.—"Threadworm infections. Prevalence, pathogenicity, periodicity and prevention." Year 1944, **2** (6320), 511-513.  
b. PAKENHAM-WALSH, R., 1944.—"Threadworm infections." [Correspondence.] Year 1944, **2** (6323), 612.

(124a) Clayton Lane reviews our knowledge of oxyuriasis in man. He concludes that a drug deadly to the worm and less risky than the infection has still to be found. R.T.L.

(124b) Commenting on Clayton Lane's article on threadworm infection [see above] Pakenham-Walsh states that methylene blue, 3 grammes thrice daily for a week, is a safe and efficient remedy. R.T.L.

**125—Medical Press and Circular.**

a. BARNETT, L., 1944.—"Hydatid disease (echinococcosis) mainly from clinical standpoint." **211** (5641), 8-12; (5642), 26-30.

**126—Medicina. Revista Mexicana.**

a. NETTEL, F., R., 1944.—"Onchocercosis. Biopsia y su interpretación clínica." **24** (463), 265-273.

**127—Medicine. Baltimore.**

a. NAPIER, L. E., 1944.—"Filariasis due to *Wuchereria bancrofti*." **23** (2), 149-179.

(127a) At the present moment, when large numbers of American and British Empire Forces are engaged in the Pacific, this review of filariasis by Napier is very timely. He deals

fully with the subject under the headings Epidemiology, Aetiology, Factors Affecting Endemicity, Pathology, Symptomatology, Diagnosis and Differential Diagnosis, Prevention, Treatment, and Prognosis. Under Distribution he includes the species or strain which in Samoa, Fiji and neighbouring islands is spread by the day-biting *Aedes pseudoscutellaris*, and under Treatment secondary infections are also dealt with. Many filarial subjects attain a considerable age and the enforced inactivity associated with some types of the disease tends to lengthen the expectation of life.

R.T.L.

### 128—Memorias do Instituto Oswaldo Cruz.

- a. JANSEN, G., 1944.—“Observações sobre o combate à esquistosomose humana em Pernambuco, no município de Catende. Índice de infestação em *Australorbis* e emprêgo da cal extinta e do sulfato de cobre no combate aos moluscos.” Ano 1943, 39 (3), 335-347. [English summary p. 347.]
- b. TRAVASSOS, L., 1944.—“Relatório da excursão do Instituto Oswaldo Cruz ao Município de Santa Teresa, no Estado do Espírito Santo, em Agosto e Setembro de 1943.” 40 (2), 121-128.
- c. JANSEN, G., 1944.—“Sobre a validade do *Australorbis centimetalis* (Lutz, 1918). (Nota prévia.)” 40 (2), 201-208.

(128a) For the eradication of *Australorbis centimetalis*, which is the vector of *Schistosoma mansoni* in Catende in the State of Pernambuco, slaked lime, in the dilution of 4% to 5%, proved more efficient and cheaper than copper sulphate. Fifty per cent. of the local population was found to be infected. The infection of the snails varied greatly. The highest percentage noted was 18.45%.

R.T.L.

(128b) A considerable number of vertebrates have been examined and provisional diagnoses are given, but in most cases only the genus, and in some only the family, has been determined.

R.T.L.

(128c) Jansen shows that *Australorbis centimetalis*, an intermediate host of *Schistosoma mansoni*, is distinct from *A. olivaceus*. They can be distinguished morphologically and biologically.

P.A.C.

### 129—Military Surgeon.

- a. PLISKIN, R. R., 1944.—“A clinical review of schistosomiasis with presentation of an interesting case.” 94 (6), 351-358.

(129a) After reviewing the clinical symptoms due to *Schistosoma mansoni*, Pliskin lists the symptoms in the following order: abdominal pain, diarrhoea, weakness, fever, nausea, loss of weight, intermittent diarrhoea and constipation, fainting, arthralgia. The physical findings occurred in the following order: enlargement of spleen, palpable liver, pallor, haemorrhagic colitis, ulcerative colitis, anaemia, joint swellings, ascites. A report on the symptoms and post-mortem findings of a case with arthralgia is appended.

R.T.L.

### 130—Mississippi Doctor.

- \*a. GRAY, A. L., 1944.—“Hookworm problem today.” 21, 217-220.

### 131—Mycologia.

- a. DRECHSLER, C., 1944.—“Three Hyphomycetes that capture nematodes in adhesive networks.” 36 (2), 138-171.

(131a) Drechsler gives illustrated technical descriptions of three hyphomycetous fungi which capture and destroy free-living nematodes by means of adhesive bait-like hyphal loops. The fungi occurred on agar plate cultures which had been inoculated with decaying roots or with leaf mould. Their names are as follows: *Arthrobotrys cladodes* var. *macrooides* n. var., *A. arthrobotryoides* (Berlese) Lindau, and *Dactylaria psychrophila* n.sp.

T.G.

### 132—Nature. London.

- a. ELLENBY, C., 1944.—“Standardization of root excretions for immunity trials on the potato eelworm.” 154 (3907), 363-364.

(132a) Ellenby describes a technique for standardizing root excretion. His method is based on the unproven assumption that the metabolic rate of root as measured by its oxygen consumption is related to the rate at which it produces root excretion. The method is described in detail and an example of an actual test on potatoes of the South American species *Solanum calcense* and of the British variety "Great Scot", is given to illustrate the utility of the method. It was found that in the case of the former, the respiration rate was lower and the root excretion obtained was less active than in the case of the latter.

D.F.

### 133—New Zealand Journal of Agriculture.

a. WHITTEN, L. K., 1944.—"Phenothiazine. Use for control of internal parasites." 69 (1), 45.

### 134—New Zealand Medical Journal.

a. MACFARLANE, W. V., 1944.—"Schistosome dermatitis in the Southern Lakes. An investigation of swimmers' itch." 43 (234), 136-140.

b. KNIGHTS, H. T., 1944.—"Comments on filariasis." [Correspondence.] 43 (235), 153-154.

(134a) Swimmers' itch and urticarial wheals of unknown causation following bathing in Lake Wanaka have been noticed during the past 20 years, and there have been unverified reports from Lakes Wakatipu, Hawea and Hayes. Macfarlane has now demonstrated their cercarial origin. The ocellated cercaria now implicated is new. It is named *C. longicauda* and develops in *Myxas ampulla*, *M. arguta* and *Limnaea alfredi*. The definitive host has not been demonstrated but ducks are suspected. The clinical and experimental lesions are succinctly described. Evidence is presented to show that papular reactions follow five or more days' sensitization to cercarial antigens.

R.T.L.

(134b) From personal experience of infection with *Loa loa* acquired in Africa, Knights draws attention to the fact that a filarial infestation may give rise to a positive Casoni reaction although the complement fixation test for hydatid is negative. A series of peptone injections relieved the local urticaria. Knights is dissatisfied with the label "clinical trypanosomiasis" in cases showing chronic encephalitic changes where trypanosomes are absent but where the blood and gland puncture show profuse infestation with *Filaria* embryos. In such cases the possibility of a cerebral filarial lesion seems strong.

R.T.L.

### 135—North American Veterinarian.

a. KOEN, J. S., 1944.—"Diseases of pigs before and after weaning." 25 (6), 339-347.

b. COFFIN, D. L., 1944.—"A case of *Dirofilaria immitis* infection in a captive-bred timber wolf (*Canis occidentalis*, Richardson)." 25 (10), 611-612.

(135a) In this article Koen does not mention any specific helminths but draws attention in a general way to the need for medication with any recognized vermicifuge in young pigs and stresses the necessity for adequate preventive measures against helminths among young pigs and of nursing sows.

P.A.C.

### 136—Parasitology.

a. DOUGHERTY, E. C., 1944.—"The lungworms (Nematoda: Pseudaliidae) of the Odontoceti. Part I." 36 (1/2), 80-94.

b. ROGERS, W. P., 1944.—"Studies on the anthelmintic activity of hexylresorcinol and tetrachlorethylene." 36 (1/2), 98-109.

c. BAYLIS, H. A., 1944.—"'Capsularia marina' and the Ascaridae of marine hosts." 36 (1/2), 119-121.

d. BAYLIS, H. A., 1944.—"Observations on the nematode *Mermis nigrescens* and related species." 36 (1/2), 122-132.

(136a) Dougherty describes *Halocercus kirbyi* n.sp. from nodules and cavities on the surface of the lungs of *Phocoenoides dalli* near San Francisco. While related to *H. invaginatus*, which is redescribed, it can be differentiated by the shape of the spicules which are very short, and by the very stout bursal rays. He is of the opinion that the lungworms of the Odontoceti constitute a distinct family, Pseudaliidae, closely related by the nature of the female genitalia.

P.A.C.

(136b) Rogers has examined the factors affecting the anthelmintic activity of tetrachlorethylene and hexylresorcinol *in vivo* and by perfusing the drugs through the lumen of isolated rat intestine infected with *Nippostrongylus muris*. Hexylresorcinol activity was reduced 50% by 1% sodium tauroglycocholate which reached a concentration of 1.3% in normal rat small intestine. Adsorption of this drug on mucin prevented its concentration in intestinal fluids and prevented penetration to parasites under mucus. These factors are considered to account for the inactivity of hexylresorcinol found *in vivo*. Tetrachlorethylene was active *in vivo* and was not greatly inhibited by bile salts or mucin. Other results obtained by the X-ray examination of the passage of fluids along the rat intestine, effects of detergents and ascorbic acid on drug activity are given.

W.P.R.

(136c) Baylis disagrees with Johnston & Mawson [see Helm. Abs., Vol. XII, No. 242e] in their arguments identifying *Anisakis simplex* with *Capsularia marina* and of *Porrocaecum decipiens* with *P. piscium* and, following this, suppressing the names *Anisakis* and *Anisakinae* on the grounds of priority. There are fundamental fallacies in their original argument. Larval Ascaridae, parasitic in fishes, cannot be identified specifically and only in the case of *Contra-caecum* can they be identified generically.

P.A.C.

(136d) Baylis presents observations on the distribution and seasonal occurrence of *Mermis nigrescens* in Great Britain. He discusses the question of insect hosts of the worm and shows, from feeding experiments, that the common earwig, *Forficula auricularia*, can serve as a host. This insect is known to serve as a host under natural conditions. He also describes two new species of the genus, namely, *M. kenyensis* n.sp. and *M. tahitiensis* n.sp. from Kenya and Tahiti respectively.

T.G.

### 137—Phytopathology.

a. HOYMAN, W. G., 1944.—“Resistance of guayule to the root-knot nematode.” 34 (8), 766-767.

(137a) Hoyman gives the results of three experiments in which guayule, *Parthenium argentatum*, was grown in soil infested with the root-knot nematode, *Heterodera marioni*. In the first case 13 plants grown in an infested field for six months showed no infestation. In another experiment of six plants grown in pots of infected soil one showed slight infestation after six months, but at the end of a further 12 months no infestation was found. In the third case 10 plants were grown for a year in artificially infected sandy soil but only one showed a very slight infestation, though tomato seedlings grown as indicators were severely infected.

M.T.F.

### 138—Plant Disease Reporter.

a. TAYLOR, A. L., 1944.—“Citrus root nematode in Florida.” 28 (8), 320-322.  
 b. TAYLOR, A. L., 1944.—“Nematode survey in Georgia.” 28 (9), 338-339.  
 c. TAYLOR, C. F., 1944.—“Distribution of the meadow nematode in Virginia. I. On boxwood.” 28 (9), 339-340.  
 d. JENKINS, W. A., 1944.—“Root rot disease-complexes of tobacco with reference to the meadow nematode: a preliminary report.” 28 (11), 395-397.  
 e. TAYLOR, A. L., 1944.—“Nematodes on potatoes in the Hastings section of Florida.” 28 (11), 403.  
 f. TAYLOR, A. L., 1944.—“Nematode survey in Georgia.” 28 (12), 432.  
 g. TAYLOR, A. L., 1944.—“Nematode survey in Georgia.” 28 (14), 483-484.  
 h. ANON, 1944.—“Golden nematode survey.” 28 (15), 520.  
 i. SHERBAKOFF, C. D., 1944.—“Wheat nematode in Tennessee.” 28 (18), 582.  
 j. TAYLOR, A. L., 1944.—“Nematode survey in southeastern States.” 28 (18), 602-604.

(138a) Taylor reports on a survey of citrus plantings in the vicinity of Lake Alfred and Orlando, Florida for the presence of the citrus root nematode *Tylenchulus semipenetrans*. At both places only moderate to light infestations were found on any of the various citrus species and relatives, including *Citrus reticulata*. *Heterodera marioni* was found in light infestations on *Hesperethusa crenulata* and *Glycomis* sp.

T.G.

(138b) In a nematode survey of Georgia carried out at the end of March and early in April, Taylor found only traces of root-knot infection on peas: beans, okra and young tomato plants

were free from infection. All these are probably to be accounted for by the fact that the soil temperature during winter months is too low for nematode activity. Note is made of the fact that in one district the wheat cockle nematode, *Anguillulina tritici*, had been reduced to trace infestations.

T.G.

(138c) C. F. Taylor found that boxwood bushes, *Buxus sempervirens* vars. *arborescens* and *suffruticosa*, which show symptoms of leaf bronzing, had associated root lesions in which eelworms, *Pratylenchus* spp., occurred. The characteristic appearance and colour of the developing lesions are described.

T.G.

(138d) Jenkins, investigating root-rot complexes on tobacco and various other crops, including wheat and rye, has found primary root lesions caused by the meadow nematode or by species of the meadow nematode group, *Pratylenchus* spp. The primary lesions may become complicated by bacterial and fungal invasions leading to typical black root-rot in susceptible tobacco varieties.

T.G.

(138e) Taylor reports on a survey made on potatoes raised in the vicinity of Hastings, Florida, for the presence of eelworm. Examinations were made from April 12 to 22, when the lifting was in full swing. Though the soil is of a sandy type he found only trace infections of the root-knot nematode, *Heterodera marioni*, on the tubers. No injury to plants was observed.

T.G.

(138f) Taylor, continuing his nematode survey of Georgia, reports on crops examined in the Savannah and Claxton areas, seen between April 24 and 29. Weather conditions had been very unfavourable to plant growth during the preceding two months. In the Savannah district only trace infections of *Heterodera marioni* were found on potatoes and lettuce in the field. In the Claxton district root-knot of tomatoes was found only in one field of 10 examined, where about 10% of the plants carried a light infection.

T.G.

(138g) In a further instalment of his nematode survey of Georgia, Taylor deals with the question of root-knot infestation on vegetable plants grown in the Tifton area, very largely for shipment elsewhere. He explains the system of certification of certain fields to lessen the risk of shipping plants infected with root-knot. Large numbers of tomato plants were examined at the packing houses and those raised on certified fields were much freer from infection than those raised on uncertified ones.

T.G.

(138h) The occurrence of the potato root eelworm, *Heterodera rostochiensis*, first reported on potatoes for U.S.A. from a small area in Long Island, New York [see Helm. Abs., Vol. XI, No. 389d], has called forth certain quarantine measures and has shown the need for a survey of soils in the more important northern potato districts to determine its present distribution.

T.G.

(138i) Sherbakoff reports that in Cocke County and Greene County, East Tennessee, the wheat "cockle" eelworm is well established. In the former it is apparently of about three years' standing whilst in the latter a farmer reported that he had observed the disease in the same field about six years previously.

T.G.

(138j) Taylor reports on nematode survey work in certain areas of the southeastern States chiefly on vegetable, fruit and tobacco crops. Root-knot nematode injury was found to be slight on potatoes grown near Savannah. The same parasite attacking peaches is being checked by the use of resistant rootstocks. Root-knot damage caused to cigar-wrapper tobacco grown under shades is one of the principal pests encountered on the crop in the vicinity of Quincy, Florida; the average loss in crop value due to this is estimated at about 5%. *Pratylenchus pratensis* lesions were found on tobacco roots and also on those of corn.

T.G.

### 139—Poultry Farmer. London.

a. BAYON, H. P., 1944.—"Worms and how to treat them." 110 (2858), 6.

(139a) Bayon points out in a very short article that it is not sufficient just to treat chickens for helminths. The soil in the runs must also be thoroughly reconditioned by breaking up and dressing with salt or lime, letting the whole rest for at least three months.

P.A.C.

## 140—Proceedings of the Helminthological Society of Washington.

- a. MAYHEW, R. L., 1944.—“Studies on bovine gastro-intestinal parasites. VII. Attempts to develop an active immunity to *Haemonchus contortus* by injection of a saline extract of adult worms.” **11** (2), 43-45.
- b. GUTHRIE, J. E. & HARWOOD, P. D., 1944.—“Limited tests of mixtures of tin oleate with ammonium compounds for the removal of experimental tapeworm infections of chickens.” **11** (2), 45-48.
- c. SPINDLER, L. A. & ZIMMERMAN, jr., H. E., 1944.—“Effect of skim milk on the growth and acquisition of parasites by pigs under conditions of constant exposure to infection.” **11** (2), 49-54.
- d. DENTON, J. F., 1944.—“The occurrence of *Eurytrema allentoshi* (Foster, 1939) in the opossum in Texas.” **11** (2), 54-55.
- e. ENZIE, F. D., 1944.—“The anthelmintic action of ‘butylphen’ in dogs.” **11** (2), 55-58.
- f. CRAM, E. B., JONES, M. & WRIGHT, W. H., 1944.—“Unsuccessful attempts to infect eleven species and subspecies of domestic Planorbidae with *Schistosoma mansoni*.” **11** (2), 64-66.
- g. DOUGHERTY, E. C., 1944.—“The genus *Metastrongylus* Molin, 1861 (Nematoda: Metastrongylidae).” **11** (2), 66-73.

(140a) Mayhew attempted to produce immunity to *Haemonchus contortus* in cattle by means of intramuscular and subcutaneous injections of saline extracts of adult worms. Three calves were used but there was no evidence that the treatment was effective. P.A.C.

(140b) It seems doubtful if a mixture of tin oleate and triethanolamine will be useful as a poultry taeniacide, for deterioration in the presence of air is very rapid. Tin oleate with ammonium hydroxide seems to be useful against *Hymenolepis carioca* but not against *Raillietina cesticillus*. P.A.C.

(140c) Spindler & Zimmerman show that it is possible to rear healthy pigs with a low level of helminth infestation using frequent administrations of skim milk. The amount of milk used must be sufficient to produce copious purging. It is probable that such treatment is useful against whipworm, Ascaris, the third stage larvae of *Oesophagostomum* and possibly in part against *Metastrongylus* and *Choerostongylus*. Oöcysts of *Eimeria* spp. are also expelled in fair numbers. P.A.C.

(140e) An alkylhydroxy benzene, p-tertiary-butyl-phenol, has given promising results against ascarids and hookworms in dogs in the dose rate of 0.2 gramme per pound of body weight. Food should be withheld for 18 hours before and four to five hours after treatment. There were no toxic reactions. The drug is also known under the name “butylphen”. R.T.L.

(140f) Cram et al. were unable to infect 11 planorbids with miracidia of *Schistosoma mansoni*: they were mostly species of *Helisoma* but single species of *Planorbis* and *Tropicorbis* are represented among the negatives. P.A.C.

(140g) Dougherty accepts three species for the genus *Metastrongylus*, viz., *M. apri*, *M. salmi* and *M. pudendotectus*. Their differences are tabulated. The prevailing use of *M. elongatus* for the genotype of the genus is not justifiable on the basis of priority. R.T.L.

## 141—Proceedings of the Indian Academy of Sciences. Section A.

- a. PARANJAPE, K. D., PHALNIKAR, N. L., BHIDE, B. V. & NARGUND, K. S., 1944.—“Synthesis of compounds related to santonin.” **19** (6), 381-384.

(141a) Paranjape et al. give a brief account of the synthesis of santonin derivatives lacking one or the other or both of the methyl groups at C8 and C10. W.P.R.

## 142—Proceedings of the Indian Academy of Sciences. Section B.

- a. RAO, G. S. R. & ANANDALWAR, N., 1944.—“The influence of hookworm infection on the heart muscle—an experimental investigation.” **19** (6), 204-210.
- b. BHALERAO, G. D. & RAO, N. S. K., 1944.—“Some helminth parasites of poultry.” **20** (1), 30-39.
- c. INAMDAR, N. B. & BHALERAO, G. D., 1944.—“On the occurrence of *Psilochasmus longicirratus* Skrjabin, 1913 in *Nyroca ferina* in India.” **20** (2), 48-50.
- d. KAW, B. L., 1944.—“Studies on the helminth parasites of Kashmir. Part III. Description of a new Allocreadiid, *Crepidostomum indicum*, from a fresh-water fish, *Schizothorax niger*, from the Dal Lake, Kashmir.” **20** (2), 72-77.

(142a) By perfusing isolated frog hearts with blood serum from cases of ankylostomiasis, it is shown that some factor, not yet isolated, is present which exercises a toxic effect on the cardiac muscle and on the blood-forming organs.

R.T.L.

(142b) Bhalerao & Rao describe *Tetrameres mohtedai* n.sp. from a fowl in Hyderabad. It can be distinguished by the size of the buccal capsules, position of the cloaca and length of spicules. There are also other dimensional distinguishing features. *Bhalfillaria badamii* n.g., n.sp. from the heart of a fowl in Patanchera resembles the genus *Macdonaldius* in the female genitalia but differs in a number of other important respects. The male was not found. They also record the presence of three other nematode species and seven cestode species among domestic poultry.

P.A.C.

(142d) Kaw reviews the genus *Crepidostomum* Braun, and considers *C. lintoni* (Pratt, in Linton) to be a synonym of *C. auriculatum* (Wedl), thus leaving 10 valid species in addition to *C. indicum* n.sp., which he describes from *Schizothorax niger*. This is distinguished by the median genital pore being anterior to the intestinal bifurcation; the large median, tandem, oval testes; the acetabulum being much larger than the oral sucker; and the six pre-oral petaloid papillae being notched.

N.G.S.

#### 143—Proceedings of the Society for Experimental Biology and Medicine.

a. OLIVER-GONZÁLEZ, J. & MONTILLA, E., 1944.—“Effect on blood agglutinins of a polysaccharide isolated from *Ascaris suum*.” 56 (2), 169-171.

(143a) Oliver-González & Montilla report that *Ascaris* polysaccharide does not affect anti-Rh, anti-M, anti-N or cold agglutinins. It is suggested that as the addition of parasite polysaccharide reduces human serum  $\alpha$  and  $\beta$  agglutinins to zero titre, it may be used in the preparation of anti-Rh, anti-M and anti-N sera, when the absence of  $\alpha$  and  $\beta$  agglutinins is required.

W.P.R.

#### 144—Public Health Reports. Washington.

a. WRIGHT, W. H., JACOBS, L. & WALTON, A. C., 1944.—“Studies on trichinosis. XVI. Epidemiological considerations based on the examination for trichinae of 5,313 diaphragms from 189 hospitals in 37 States and the District of Columbia.” 59 (21), 669-681.

(144a) An examination of over 5,000 diaphragms in the United States shows that trichinosis is very uniformly spread throughout the country and is largely independent of such factors as social status, sex, occupation, mental health, etc., though there is evidence of a higher rate among individuals of German or Italian extraction. Trichina larvae may be very long-lived but some die and undergo calcification quickly: calcified larvae have been found in children aged five to nine years.

P.A.C.

#### 145—Queensland Agricultural Journal.

a. SUTHERLAND, A. K. & REIK, R., 1944.—“Treatment against worm parasites of cattle.” 59 (1), 56-58.  
 b. SUTHERLAND, A. K. & REIK, R., 1944.—“Treatment of pigs for large roundworm infestation.” 59 (1), 58-59.  
 c. SUTHERLAND, A. K. & REIK, R., 1944.—“Phenothiazine for worm parasites in horses.” 59 (1), 60.

#### 146—Revista de la Asociación Médica Argentina.

a. SILVEIRA, J., 1944.—“A localização pulmonar da esquistosomose americana.” 58 (536), 444-447.

#### 147—Revista Brasileira de Biologia.

a. RUIZ, J. M., 1944.—“Considerações sobre a classificação das famílias Pronocephalidae Looss, 1902 e Notocotylidae Luehne, 1909.” 4 (2), 215-228.

(147a) Ruiz elevates the subfamily Hippocrepinae Mehra, 1932, to family rank, creating the new family Hippocrepidae for it. The description of the family Pronocephalidae is emended

to include six subfamilies—Pronocephalinae, Notocotylinae, Nudacotylinae, Charaxicephalinae, Neopronocephalinae and Opisthotrematinae. In this emendation the Notocotylidae are reduced to subfamily rank and the Ogmogasterinae Kossack, 1911 and Ogmocotylinae Skrjabin & Schulz, 1933, are considered to be synonyms of it. The Teloporiinae Stunkard, 1934 becomes a synonym of Pronocephalinae.

P.A.C.

**148—Revista de la Facultad de Medicina. Bogotá.**

a. ARANGO, E. G., 1944.—“Anemia por ancylostomiasis.” **12** (8), 389–396.

**149—Revista Ibérica de Parasitología.**

a. GONZÁLEZ CASTRO, J., 1944.—“Contribución al estudio del parasitismo por helmintos o sus fases larvarias de diversos murídos capturados en Granada.” **4** (1), 38–60.

(149a) An examination of various species of *Epimys* and *Mus* in Granada revealed the presence of *Hymenolepis nana*, *H. diminuta*, *Catenotaenia pusilla*, *Ganguleterakis spumosa*, *Trichuris muris*, *Aspiculuris tetraptera*, *Syphacia obrelata*, *Gongylonema neoplasticum*, *Hepaticola hepatica* and *Cysticercus fasciolaris*. The only specimen of *Pitymys ibericus regulus* that was examined contained no helminths.

P.A.C.

**150—Revista del Instituto de Salubridad y Enfermedades Tropicales. Mexico.**

a. MAZZOTI, L. & LOZANO HUBE, E., 1944.—“La prueba intracutánea de Bachman para el diagnóstico de la triquinosis en 1,000 personas sanas de la ciudad de México.” **5** (1), 31–36. [English summary p. 35.]

(150a) 17.9% of 1,000 apparently healthy persons in the City of Mexico gave a positive reaction with Bachman's intradermal test for *Trichinella spiralis* infection. As interpreted by McNaught, Beard & Myers [see Helm. Abs., Vol. X, No. 48a] this percentage should be reduced to 13.8%.

R.T.L.

**151—Revista de Medicina Tropical y Parasitología, Bacteriología, Clínica y Laboratorio.**

a. KOURÍ, P. & ANGULO, J. J., 1944.—“Un nuevo hospedero de la forma larvaria del *Multiceps serialis*.” **10** (3), 64–69.  
b. GALÍNDEZ, L. & MAGDALENA, A., 1944.—“Contribución al estudio de las parasitosis de las vías digestivas.” **10** (3), 71–72. [Reprinted from: Revista Médica Latino-Americana, 1943, **28**, 235–236.]

(151a) Kourí & Angulo have found *Coenurus serialis* in *Capromys pilorides*, a new host record. The cysts lay in the abdominal cavity and were proliferating. Tumour formation had occurred. A single infection only is recorded. This is the first record of the parasite in Cuba.

P.A.C.

**152—Schweizerische Medizinische Wochenschrift.**

a. BAUMANN, H., 1944.—“Eosinophile Pleuritis bei flüchtigem, eosinophilem Lungeninfiltrat.” **74** (13), 326–328.  
b. GUHL, R., 1944.—“Ueber Ascaridiasis der Gallenwege.” **74** (22), 600–605.

(152a) Numerous eosinophiles in pleural effusion and in the scanty sputum followed in three months by the passage of *Ascaris* eggs in the faeces suggests that the evanescent lung symptoms were due to migrating *Ascaris* larvae.

R.T.L.

**153—Science.**

a. RATCLIFFE, H. L., 1944.—“A method for preparing permanent slides of the ova of parasitic worms.” **99** (2576), 394.

(153a) The method which Ratcliffe details is based on the formula of the gum acacia-chloral hydrate given by W. Morrison (Turtox News, 1942, **20**, 157). Several months are required to carry out the actual procedure. Hookworm eggs are, however, badly distorted.

R.T.L.

## 154—South African Medical Journal.

- a. CAWSTON, F. G., 1944.—“Propamidine in bilharziasis.” 18 (13), 228-229.
- b. CAMPBELL BEGG, R., 1944.—“Bilharzia disease: some prevalent misconceptions.” 18 (14), 239-241.

(154a) Propamidine proved useful in a case of cystitis associated with bilharziasis. Cawston thinks this treatment can hardly be warranted as only after a total of 1.5 grammes had been given did the eggs in the urine show degeneration. R.T.L.

(154b) Of 130 cases seen during the last three years by Campbell Begg, 75% had had to wait from 5 to 25 years before Bilharzia was diagnosed. In most cases of chronic Bilharzia the urine is normal. The only reliable method of diagnosis is by direct cystoscopy. Any case with persistent ill-health, with symptoms of indigestion and upper abdominal pain, with or without tenderness in the region of the kidney or ureters, must be considered as probably due to Bilharzia. R.T.L.

## 155—Southern Medical Journal.

- a. BAILEY, W. C., 1944.—“A study of the incidence and treatment of intestinal parasites in southeastern Kentucky.” 37 (7), 407-409.

## 156—Stain Technology.

- a. MINCKLER, D., 1944.—“Rapid clearing of pin worms (*Enterobius vermicularis*) for class study.” 19 (2), 63-64.

(156a) This “rapid” method of clearing Oxyuris for class study requires six procedures covering a period of “less than 3 days”. Formalin-fixed specimens are dehydrated in dioxane and cleared in carbol xylene. R.T.L.

## 157—Technical Bulletin. United States Department of Agriculture.

- a. HARTER, L. L. & ZAUMEYER, W. J., 1944.—“A monographic study of bean diseases and methods for their control.” No. 868, 160 pp.

(157a) Amongst other diseases, the symptoms caused by the root-knot nematode, *Heterodera marioni*, are described, and it is recommended that on infected land resistant crops should be grown. It is thought that it may be possible to develop resistant varieties of beans. M.T.F.

## 158—Transactions of the American Microscopical Society.

- a. MARTIN, W. E., 1944.—“Studies on trematodes of Woods Hole IV. Additional observations upon *Cercaria loossi* Stunkard developing in an annelid.” 63 (3), 237-243.
- b. SEIBERT, H. C., 1944.—“Notes on the genus *Diplotriaena* with the description of a new species.” 63 (3), 244-253.

(158a) Martin redescribes *Cercaria loossi* Stunkard, and confirms Linton's finding that the first intermediate host is unique in being a polychaete. Some 3% of 121 *Hydrodides hexagonus* were found infected in Vineyard Sound, Mass. Sporocysts develop in the body cavity where they may replace up to two-thirds of the muscle, especially in the posterior segments: they were liberated intact with the genital products, and cercariae emerged later but showed no phototropism. Nothing is known of the further development of this form, but it is thought to be an aporocotylid from the blood of a marine fish. N.G.S.

(158b) Seibert describes *Diplotriaena thomasi* n.sp., a filariid parasite of the body cavity of the white-throated sparrow, *Zonotrichia albicollis*, in Illinois. It is easily distinguished by the small size of the tridents, each arm measuring from 0.40 to 0.67 mm. in length. They seem to be smaller in the female than in the male. He suggests that many of the species attributed to this genus are not valid ones and that a critical examination will show some of the specific names to be synonyms. Though several of the sparrows were infested with the new species, only in one were microfilariae found in the circulating blood. A table for the identification of species is given. P.A.C.

## 159—United States Naval Medical Bulletin.

- a. MILLER, jr., J. J. & WILBUR, D. L., 1944.—“Paragonimiasis (endemic haemoptysis). Report of 3 cases.” 42 (1), 108-117.
- b. FOGL, R. H. & HUNTINGTON, jr., R. W., 1944.—“Genital manifestations of early filariasis.” 43 (2), 263-270.

(159a) Naval and Marine Corps personnel returning from the South Pacific to the United States may be suffering from paragonimiasis. Miller & Wilbur therefore briefly review the subject and record their observations on three such cases. One had served in the Solomon Islands, one in British Samoa, and one in American Samoa. The most notable symptoms were persistent chronic cough, pain in the chest, and expectoration of tenacious brown-flecked colourless sputum. In one case only was there haemoptysis. [The faeces does not appear to have been examined for Paragonimus eggs in those cases where the sputum was negative.]

R.T.L.

(159b) Filariasis should be suspected in any patient with genital pain or swelling who has been in the South Pacific area. The clinical entity for which the native term is “mumu” has been found to be very prevalent among American troops in that region. There is no efficacious drug treatment. Rest in bed and the application of an ice bag have proved helpful. R.T.L.

## 160—Veterinary Medicine.

- a. BRITTON, J. W., 1944.—“Phenothiazine in cattle practice.” 39 (6), 239-242.
- b. THOMAS, W. E., 1944.—“Stomach worm infestation in a horse.” 39 (6), 256-257.
- c. OLSEN, O. W., 1944.—“Distomiasis of cattle.” 39 (7), 286.

(160a) Parasitic gastritis occurs in calves and steers on the irrigated Ladino-clover pastures in California. Where there is overcrowding the animals show anaemia, diarrhoea, submaxillary oedema, rough coat and emaciation of gradual onset. Where the infection is associated with malnutrition in range cattle rapid emaciation and diarrhoea may result in death within a fortnight, the mortality ranging from 10% to 20%. These cases are often mistaken for haemorrhagic septicaemia. These intense infections are acquired from small green areas around water holes, springs and creek beds in dried up ranges. Phenothiazine in doses of 15 grammes for calves and 30 grammes for yearlings have given prompt clinical improvement. The dose is administered in gelatin capsules or mixed in the grain ration and is non-toxic. The superiority of phenothiazine over cunic mixture was confirmed.

R.T.L.

(160b) A horse which was a “bad doer” with periodical colicky pains was found at post-mortem to have a pyloric tumour which interfered with the passage of food. The tumour was due to *Habronema megastoma* of which there were many specimens. A mixture of carbon disulphide and phenothiazine given after an 18-hours’ fast had not removed any of the parasites.

R.T.L.

(160c) The loss from liver-fluke in cattle in U.S.A. is estimated at 10,000 animals annually. The molluscan vector is practically universally present in the coastal prairies of Texas. The use of carbon tetrachloride is inadvisable, but hexachlorethane given as an aqueous suspension is a highly satisfactory remedy. 500 grammes of hexachlorethane is mixed thoroughly with 50 grammes of powdered bentonite. 750 c.c. of water is slowly added, with constant stirring. An electric kitchen mixer is used for the final mixing. Of the 1,000 c.c. of suspension resulting, 200 c.c. is administered to each adult, and 100 c.c. to each calf. Of 3,700 animals so treated only six, extremely debilitated, were lost.

R.T.L.

## 161—Veterinary Record.

- a. BINGHAM, M. L., 1944.—“Some clinical diagnostic methods of use in conditions associated with animal parasites.” 56 (35), 313-316. [Discussion p. 316.]
- b. REES-MOGG, G., 1944.—“Nicotine and copper sulphate for lambs.” [Correspondence.] 56 (36), 326.

(161a) In an address to the Society of Women Veterinary Surgeons, Bingham describes the various techniques employed in the diagnosis of parasitic infections of animals. The greater portion of her address is devoted to helminthological technique and includes descriptions of

the methods of faecal examination, egg-counting and the enumeration of the worms found on autopsy. The factors influencing egg-counts and the interpretation of the results obtained from faecal examinations are also discussed.

D.O.M.

(161b) Referring to an article in the *Vet. Rec.*, 56, 276-277 on "Nicotine poisoning in lambs", Rees-Mogg writes that he had used the following mixture over a number of years without causing any deaths in lambs: copper sulphate 4 oz., nicotine sulphate (40%) 4 oz., water 3 gallons, given at the rate of  $3\frac{1}{2}$  oz. to a ewe and 2 oz. to a lamb. On one occasion when he doubled the dose he lost four lambs.

D.O.M.

### 162—War Medicine.

a. DAVIS, H., 1944.—"Ancylostomiasis associated with hematuria." 5 (6), 385-388.

(162a) On the basis of a study of an American soldier who had an infection with hookworm and showed a microscopical haematuria and albuminuria, Davis concludes that these urinary abnormalities were the result of the hookworm infection, for they disappeared when the helminths were removed.

R.T.L.

### 163—Zeitschrift für Fleisch- und Milchhygiene.

a. GRÜTTNER, F., 1944.—"Leberegel und Fleischvergifterbefall." 54 (14), 133-135.

b. SCHÖNBERG, F., 1944.—"Zur Probeentnahme aus den Zwerchfellpfeilern für die Untersuchung auf Trichinen bei Schweinen." 54 (14), 137-138.

(163a) Grüttner found that 7 of a herd of 15 young cattle were carriers of Gärtner bacillus, and that all 7 were in a more or less advanced stage of liver-fluke disease. It is concluded that liver-fluke infection lessens resistance to bacterial infections, although the general condition of the animals may still appear good.

A.E.F.

(163b) Schönberg emphasizes that specimens from pigs for *Trichinella* examination should be taken from the pillars of the diaphragm near the central tendon.

A.E.F.

## NON-PERIODICAL LITERATURE

164—NATIONAL VETERINARY MEDICAL ASSOCIATION, 1944.—"Memorandum on hill sheep farming." 44 pp.

165—NATIONAL VETERINARY MEDICAL ASSOCIATION, 1944.—"Report on diseases of farm livestock. Section II. Diseases of sheep." 101 pp.

166—YETWIN, I. J., 1944.—"Medical parasitology: a laboratory manual." Waltham, Mass. 4th edit., x + 126 pp.



